

CLAIMS

The invention claimed is:

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1. A transmitting device comprising:
an input for receiving data that represents sound;
a low pass filter for selecting a first group of the data that represents sound within
a low portion of a sound bandwidth;
a high pass filter for selecting a second group of the data that represents sound
10 within a high portion of the sound bandwidth; and
a transmit buffer for transmitting to a network the first data group in a first packet
and the second data group in a second packet distinct from the first packet.

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2. The device of claim 1, further comprising:
encoding means for encoding the first data group and the second data group prior
to transmitting it.

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3. The device of claim 1, further comprising:
a switch having
a first position for the transmit buffer to receive the first data group from the low
pass filter, and
a second position for the transmit buffer to receive the second data group from the
high pass filter.

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4. The device of claim 3, further comprising:
a delay buffer for delaying the arrival to the switch of one of the first data group
and the second data group.

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5. A receiving device comprising:
a network interface for coupling to a network; and

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a processor coupled with the network interface, wherein the processor is adapted
to
receive a first packet and a second packet from the network,
extract a first group of data from the first packet representing sound belonging in
5 a first band of a sound bandwidth,
extract a second group of data from the second packet representing sound
belonging in a second band of the sound bandwidth distinct from the first band, and
combine the first data group with the second data group to construct a single
frame with data representing sound in both the first band and the second band.

6. A receiving device comprising:
a network interface for coupling to a network; and
a processor coupled with the network interface, wherein the processor is adapted
to
15 infer a first group of data representing sound belonging in a first band of a sound
bandwidth,
receive a packet from the network,
extract a second group of data from the packet representing sound belonging in a
second band of the sound bandwidth distinct from the first band, and
20 combine the first data group with the second data group to construct a single
frame with data representing sound in both the first band and the second band.

7. The device of claim 6, wherein the processor is further adapted to:
receive at least one additional packet, and
25 extract an additional first group of data from the additional packet representing
sound belonging in the first band,
wherein the first data group is inferred from the additional first data group.

8. The device of claim 6, wherein
30 the first data group is identical to the additional data group.

9. The device of claim 6, wherein the processor is further adapted to:
receive abbreviated redundant data corresponding to the first data group, and
expand the received abbreviated data.

5 ~~10.~~ An article comprising: a storage medium, said storage medium having stored
thereon instructions, that, when executed by at least one device, result in:
arranging data that represents sound in a plurality of frames;
dividing the data of at least one frame into a first group that represents sound
within a first band of a sound bandwidth and a second group that represents sound within
10 a second band of the sound bandwidth;
encoding the first data group as a first packet;
encoding the second data group as a second packet distinct from the first packet;
and
transmitting the first packet and the second packet through the network.

15 11. The article of claim 10, wherein
the first band is a low-frequency band, and
the second band is a high-frequency band.

20 12. The article of claim 10, wherein
the first packet also includes data from a second frame distinct from the first
frame, and
the second packet also includes data from a third frame distinct from the first and
second frames.

25 13. The article of claim 10, wherein the instructions further result in:
abbreviating and transmitting redundantly the first data group through the
network.

30 14. The article of claim 13, wherein the instructions further result in:
abbreviating includes down-sampling the first data group.

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15. An article comprising: a storage medium, said storage medium having stored thereon instructions, that, when executed by at least one device, result in:
- receiving three sequential frames of data that represent sound;
 - 5 dividing the data of each of the three frames into a first group that represents sound within a low band of a sound bandwidth and a second group that represents sound within a high band of the sound bandwidth;
 - encoding the first data group of the first frame and the second data group of the second frame as a first packet;
 - 10 encoding the first data group of the second frame and the second data group of the third frame as a second packet; and
 - transmitting the first and second packets through the network.
16. The article of claim 15, wherein the instructions further result in:
- 15 abbreviating and transmitting redundantly at least one of the first data group and the second data group through the network.
17. An article comprising: a storage medium, said storage medium having stored thereon instructions, that, when executed by at least one device, result in:
- 20 receiving a first packet and a second packet from a network;
 - extracting a first group of data from the first packet representing sound belonging in a first band of a sound bandwidth;
 - extracting a second group of data from the second packet representing sound belonging in a second band of the sound bandwidth distinct from the first band; and
 - 25 combining the first data group with the second data group to construct a single frame with data representing sound in both the first band and the second band.
18. An article comprising: a storage medium, said storage medium having stored thereon instructions, that, when executed by at least one device, result in:
- 30 inferring a first group of data representing sound belonging in a first band of a sound bandwidth;

receiving a packet from a network;
extracting a second group of data from the packet representing sound belonging in
a second band of the sound bandwidth distinct from the first band; and
combining the first data group with the second data group to construct a single
5 frame with data representing sound in both the first band and the second band.

19. The article of claim 18, wherein the instructions further result in:
receiving at least one additional packet; and
extracting an additional first group of data from the additional packet representing
10 sound belonging in the first band,
wherein the first data group is inferred from the additional first data group.

20. The article of claim 18, wherein
the first data group is identical to the additional data group.

21. The article of claim 18, wherein the instructions further result in:
receiving abbreviated redundant data corresponding to the first data group; and
expanding the received abbreviated data.

22. A method comprising:
arranging data that represents sound in a plurality of frames;
dividing the data of at least one frame into a first group that represents sound
within a first band of a sound bandwidth and a second group that represents sound within
a second band of the sound bandwidth;
25 encoding the first data group as a first packet;
encoding the second data group as a second packet distinct from the first packet;
and
transmitting the first packet and the second packet through the network.

23. The method of claim 22, wherein
the first band is a low-frequency band, and

the second band is a high-frequency band.

24. The method of claim 22, wherein

the first packet also includes data from a second frame distinct from the first
5 frame, and

the second packet also includes data from a third frame distinct from the first and
second frames.

25. The method of claim 22, further comprising:

10 abbreviating and transmitting redundantly the first data group through the
network.

26. The method of claim 25, wherein

abbreviating includes down-sampling the first data group.

27. A method comprising:

receiving three sequential frames of data that represent sound;

dividing the data of each of the three frames into a first group that represents
sound within a low band of a sound bandwidth and a second group that represents sound
20 within a high band of the sound bandwidth;

encoding the first data group of the first frame and the second data group of the
second frame as a first packet;

encoding the first data group of the second frame and the second data group of the
third frame as a second packet; and

25 transmitting the first and second packets through the network.

28. The method of claim 27, further comprising:

abbreviating and transmitting redundantly at least one of the first data group and
the second data group through the network.

29. The method of claim 28, wherein

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abbreviating includes down-sampling.

30. The method of claim 28, wherein
abbreviating includes determining a complementary band information synthesis
5 shift between one of the first data group and one of the second data group.

31. A method comprising:
receiving a first packet and a second packet from a network;
extracting a first group of data from the first packet representing sound belonging
10 in a first band of a sound bandwidth;
extracting a second group of data from the second packet representing sound
belonging in a second band of the sound bandwidth distinct from the first band; and
combining the first data group with the second data group to construct a single
frame with data representing sound in both the first band and the second band.

32. A method comprising:
inferring a first group of data representing sound belonging in a first band of a
sound bandwidth;
receiving a packet from a network;
20 extracting a second group of data from the packet representing sound belonging in
a second band of the sound bandwidth distinct from the first band; and
combining the first data group with the second data group to construct a single
frame with data representing sound in both the first band and the second band.

33. The method of claim 32, further comprising:
receiving at least one additional packet; and
extracting an additional first group of data from the additional packet representing
sound belonging in the first band,
wherein the first data group is inferred from the additional first data group.

34. The method of claim 32, wherein

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the first data group is identical to the additional data group.

35. The method of claim 32, wherein
the first data group is determined from a weighted average that includes the
5 additional data group.

36. The method of claim 32, wherein inferring is performed by:
receiving abbreviated redundant data corresponding to the first data group; and
expanding the received abbreviated data.

37. The method of claim 36, wherein expanding includes
up-sampling the abbreviated data.

38. The method of claim 32, wherein inferring includes
15 using a complementary band information synthesis shift to infer data in the first
band from data in the second band.

39. The method of claim 38, further comprising:
receiving and decoding the complementary band information synthesis shift.

40. The method of claim 38, further comprising:
determining the complementary band information synthesis shift from at least one
other received first data group and at least one received second data group.

25 ~~41.~~ A transmitting device comprising:
input means for receiving data that represents sound;
low pass filter means for selecting a first group of the data that represents sound
within a low portion of a sound bandwidth;
high pass filter means for selecting a second group of the data that represents
30 sound within a high portion of the sound bandwidth; and

transmit buffer means for transmitting to a network the first data group in a first packet and the second data group in a second packet distinct from the first packet.

42. The device of claim 41, further comprising:

5 encoding means for encoding the first data group and the second data group prior to transmitting it.

43. The device of claim 41, further comprising:

switch means having

10 a first position for the transmit buffer means to receive the first data group from the low pass filter, and

a second position for the transmit buffer means to receive the second data group from the high pass filter.

15 44. The device of claim 43, further comprising:

delay buffer means for delaying the arrival to the switch of one of the first data group and the second data group.

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